

Appl. No. 09/926,375
Response dated October 11, 2005
Reply to Office action of August 12, 2005.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A transgenic non-human animal mammal that carries in the genome of its somatic and germ cells a transgene construct comprising (a) a transgene encoding a phytase protein operably linked to (b) a first mammalian regulatory sequence for salivary gland specific expression of said protein, and (c) a signal sequence for secretion of said protein wherein said animal mammal is selected from the group consisting of pigs, goats, sheep, cows and horses and the animal mammal expresses and secretes the protein in its salivary glands.
2. (Currently amended) The animal mammal of claim 1 wherein said first regulatory sequence comprises a salivary protein promoter/enhancer sequence.
3. (Currently amended) The animal mammal of claim 2 wherein said saliva protein promoter/enhancer sequence comprises a parotid secretory protein (PSP) promoter/enhancer, a proline-rich protein (PRP) promoter/enhancer or a salivary amylase promoter/enhancer.
4. (Currently amended) The animal mammal of claim 3 wherein said promoter/enhancer is a parotid secretory protein (PSP) promoter/enhancer.
5. (Currently amended) The animal mammal of claim 4 wherein said parotid secretory protein (PSP) promoter/enhancer is derived from a mouse.
6. (Currently amended) The animal mammal of claim 3 wherein said promoter/enhancer is a proline-rich protein (PRP) promoter/enhancer.

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7. (Currently amended) The ~~animal~~ mammal of claim 6 wherein said proline-rich protein (PRP) promoter/enhancer is derived from a rat.

8. (Currently amended) The ~~animal~~ mammal of claim 1 wherein said transgene is further operably linked to ~~(c)~~ (d) one or more second regulatory sequences including enhancers, transcription regulatory sequences, termination sequences, and polyadenylation sites.

9. (Currently amended) The ~~animal~~ mammal of claim 1 wherein said ~~animal~~ mammal is a pig.

10. (Currently amended) The ~~animal~~ mammal of claim 1 wherein said phytase is *Escherichia coli* AppA phytase.

11. (Currently amended) The ~~animal~~ mammal of claim 1 wherein said ~~animal~~ mammal is a pig and said first regulatory sequence comprises a parotid secretory protein (PSP) promoter/enhancer or a proline-rich protein (PRP) promoter/enhancer.

12. (Currently amended) The ~~animal~~ mammal of claim 1 wherein said transgene construct comprises a nucleic acid sequence according to SEQ ID NO:3, SEQ ID NO:5; or SEQ ID NO:7.

Claims 13-16 Canceled.

17. (Currently amended) The ~~animal~~ mammal of claim ~~13~~ 1 wherein said phytase is secreted in saliva ~~or~~ and in the gastrointestinal tract of said ~~animal~~ mammal.

18. (Canceled)

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19. (Currently amended) A method of expressing and secreting ~~or-expressing~~ a phytase protein in the gastrointestinal tract of ~~an animal~~ a non-human mammal, the method comprising the steps of:

a) introducing a transgene construct into a non-human mammalian animal embryo such that a non-human transgenic animal mammal that develops from said embryo has a genome that comprises said transgene construct, wherein said transgene construct comprises:

- i) a transgene encoding said phytase protein, and
- ii) at least one mammalian regulatory sequence for salivary gland specific expression of said phytase protein, and
- (iii) a signal sequence for secretion of said phytase protein

b) transferring said embryo to a foster female; and,

c) developing said embryo into said transgenic ~~animal~~ mammal

wherein said phytase is expressed ~~or~~ and secreted in the gastrointestinal tract of said animal mammal, wherein said animal mammal is selected from the group consisting of pigs, goats, sheep, cows and horses.

Claims 20-21 (Cancelled)

22. (Previously presented) The method of claim 19 wherein said salivary gland is a parotid gland, submaxillary gland, or a submandibular gland.

23. (Currently amended) The method of claim 19 wherein said transgene is expressed and secreted in the salivary gland of said animal.

24. (Original) The method of claim 19 wherein said at least one regulatory sequence comprises a salivary protein promoter/enhancer sequence.

Claims 25-26 (Cancelled)

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27. (Previously presented) A method according to claim 19 wherein said phytase is *Escherichia coli* AppA phytase.

28. (Original) The method of claim 19 wherein said transgene construct comprises a nucleic acid sequence according to SEQ ID NO:3, SEQ ID NO:5, or SEQ ID NO:7.

29. (Currently amended) A transgenic animal mammal prepared according to the method of claim 19, or a progeny thereof.

30. (Currently amended) A process for producing a phytase protein comprising the steps of:

a) obtaining salivary gland secretion containing said phytase protein from a non-human transgenic animal mammal selected from the group consisting of pigs, goats, sheep, cows and horses, said animal mammal containing within its genome a transgene construct, wherein said transgene construct comprises:

- i) a transgene encoding said phytase protein, and
- ii) at least one mammalian regulatory sequence for salivary gland specific expression of said protein, and
- (iii) a signal sequence for secretion of said phytase protein; and

extracting said protein from said saliva.

31. (Original) The process of claim 30 wherein said at least one regulatory sequence comprises a salivary protein promoter/enhancer sequence.

Claim 32 (Cancelled)

33. (Original) The process of claim 30 wherein said transgene construct comprises a nucleic acid sequence according to SEQ ID NO:3, SEQ ID NO:5; or SEQ ID NO:7.

34. (Previously presented) The process of claim 30 wherein said phytase is *Escherichia coli* AppA phytase.

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35. (Original) The process of claim 30 wherein said salivary gland is a parotid gland, submaxillary, or a submandibular gland.

36. (Withdrawn) A method for expressing a phytase in a non-human animal, said method comprising:

a) constructing a nucleic acid sequence including a transgene construct comprising:

- i) a transgene encoding said phytase, and
- ii) at least one regulatory sequence for gastrointestinal tract specific expression of said protein, and

b) transfecting the animal with said nucleic acid sequence;

whereby said animal carries within the genome of its somatic and germ cells said transgene construct and wherein said animal expresses said phytase in its gastrointestinal tract and wherein the animal is selected from the group consisting of pigs, goats, sheep, cows, horses, fish and poultry.

37. (Withdrawn) The method of claim 36 wherein said transgene construct results in salivary gland or pancreatic gland specific expression of said phytase.

38. (Withdrawn) The method of claim 37 wherein said regulatory sequence provides for salivary gland specific expression of said phytase.

39. (Withdrawn) The method of claim 38 wherein said salivary gland is a parotid gland, submaxillary, or a submandibular gland.

40. (Withdrawn) The method of claim 38 wherein said phytase is expressed in the saliva of said mammal.

41. (Withdrawn) The method of claim 38 wherein said transgene construct comprises a nucleic acid sequence according to SEQ ID NO:3, SEQ ID NO:5; or SEQ ID NO:7.

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42. (Withdrawn) The method of claim 38 wherein said transgene construct comprises a nucleic acid sequence according to SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:4, or SEQ ID NO:6.
43. (Withdrawn) The method of claim 38 wherein said animal is a pig.
44. (Withdrawn) A nucleic acid molecule comprising (a) a nucleic acid sequence encoding a phytase operably linked to (b) at least one regulatory sequence for gastrointestinal tract specific expression of said phytase.
45. (Withdrawn) The molecule of claim 44 wherein said at least one regulatory sequence comprises a salivary protein promoter/enhancer sequence, whereby expression of said protein is salivary gland specific.
46. (Withdrawn) The molecule of claim 45 wherein said salivary protein promoter/enhancer sequence comprises a parotid secretory protein (PSP) promoter/enhancer, a proline-rich protein (PRP) promoter/enhancer, a salivary amylase promoter/enhancer, or a SV40 promoter/enhancer.
47. (Withdrawn) The molecule of claim 44 wherein said molecule comprises a nucleic acid sequence according to SEQ ID NO:1, SEQ ID NO:2, SEQ ID NO:4, or SEQ ID NO:6.
48. (Withdrawn) The molecule of claim 44 wherein said molecule includes a nucleic acid sequence according to SEQ ID NO:3, SEQ ID NO:5; or SEQ ID NO:7.
49. (Withdrawn) An antibody specific to a protein expressed by a nucleic acid sequence according to SEQ ID NO:3, SEQ ID NO:5; or SEQ ID NO:7.
50. (Withdrawn) The antibody of claim 49 wherein said antibody is monoclonal.

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51. (Withdrawn) The antibody of claim 49 wherein said antibody is polyclonal.
52. (Withdrawn) A hybridoma secreting the antibody of claim 50.
53. (Withdrawn) A host cell transfected with molecule according to claim 44.
54. (Withdrawn) The host cell of claim 53 wherein said cell is an animal cell.
55. (Withdrawn) A diagnostic kit for immunologically detecting a protein expressed by a nucleic acid sequence according to SEQ ID NO:3, SEQ ID NO:5; or SEQ ID NO:7, the kit including an antibody specific to said protein.
56. (Withdrawn) The kit of claim 55 wherein said antibody is monoclonal.
57. (Withdrawn) The kit of claim 56 wherein said antibody is polyclonal.